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Quad Cities Generating Station
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ComEd

SVP-98-262

July 27, 1998

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

Reference: Quad Cities Nuclear Power Station
Docket Number 50-265, DPR-30, Unit Two

Enclosed is Licensee Event Report (LER) 98-003, Revision 00, for Quad Cities Nuclear Power Station.

This report is submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(iv). The licensee shall report any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature.

The following commitment is being made by this letter:

1. A method of verifying the integrity of the generator circuits in high vibration areas will be developed by Operational Analysis Department to determine appropriate preventative maintenance activities, including periodicity, by September 30, 1998.

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PDR ADOCK 05000265
S PDR

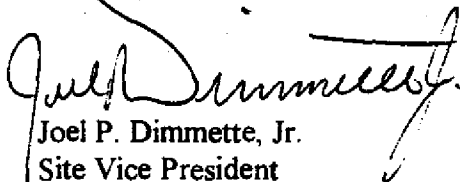
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SVP-98-262

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If there are any questions or comments concerning this letter, please refer them to Charles Peterson, Regulatory Affairs Manager at 309-654-2241, ext. 3609.

Sincerely,



Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Station

JPD/CP/siv

Enclosure

cc: C. J. Paperiello, Acting Regional Administrator, Region III
R. M. Pulsifer, Project Manager, NRR
C. G. Miller, Senior Resident Inspector, Quad Cities
W. D. Leech, MidAmerican Energy Company
D. C. Tubbs, MidAmerican Energy Company
INPO Records Center
Office of Nuclear Facility Safety, IDNS
Stanley P. Focht, American Nuclear Insurers

July 27, 1998

bcc: N. Reynolds, Winston & Strawn
Rod Krich, VP Regulatory Services, Corporate, ComEd
Bob Rybak, Licensing, Quad Cities and Dresden, ComEd
Frank Spangenberg, Regulatory Affairs Manager, Dresden
Charles Peterson, Regulatory Affairs Manager, Quad Cities
Kelly Bethard, NRC Coordinator, Quad Cities
Patti Roggendorf, SRB Site coordinator, Quad Cities
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SVP Letter File

LICENSEE EVENT REPORT (LER)

Form Rev. 2.0

Facility Name (1) Quad Cities Unit Two										Docket Number (2) 0 5 0 0 0 2 6 5										Page (3) 1 of 0 4				
Title (4) A Unit Two Main Generator Trip and Subsequent Reactor Scram occurred due to a loose electrical connection in a current transformer that was caused by vibration.																								
Event Date (5)					LER Number (6)					Report Date (7)					Other Facilities Involved (8)									
Month		Day		Year	Year	Sequential Number			Revision Number	Month		Day		Year	Facility Names		Docket Number(s)							
0	6	2	8	1998	1998		0	0	3	0	0	0	7	2	7	1998		0	5	0	0	0		
OPERATING MODE (9) 1					THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																			
POWER LEVEL (10)		1		0		0		20.402(b)			20.405(c)			X		50.73(a)(2)(iv)			73.71(b)					
						20.405(a)(1)(i)			50.36(c)(1)					50.73(a)(2)(v)			73.71(c)							
						20.405(a)(1)(ii)			50.36(c)(2)					50.73(a)(2)(vii)			Other (Specify in							
						20.405(a)(1)(iii)			50.73(a)(2)(i)					50.73(a)(2)(viii)(A)			Abstract below and							
						20.405(a)(1)(iv)			50.73(a)(2)(ii)					50.73(a)(viii)(B)			in Text							
						20.405(a)(1)(v)			50.73(a)(2)(iii)					50.73(a)(2)(x)										
LICENSEE CONTACT FOR THIS LER (12)																								
Name Charles Peterson, Regulatory Affairs Manager, ext. 3609															TELEPHONE NUMBER AREA CODE 3 0 9 6 5 4 - 2 2 4 1									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																								
CAUSE		SYSTEM		COMPONENT		MANUFACTURER		REPORTABLE TO EPIX		CAUSE		SYSTEM		COMPONENT		MANUFACTURER		REPORTABLE TO EPIX						
SUPPLEMENTAL REPORT EXPECTED (14)															Expected Submission Date (15)					Month Day Year				
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO														

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

ABSTRACT:

On 06281998, at 0223, Unit 2 was in Power Operation at 100% power. A Unit 2 Main Generator trip and subsequent Reactor Scram occurred. A walkdown of the relay targets associated with the Unit 2 Main Generator was performed. A differential protective relay on the "C" phase for the Main Generator was found actuated. Simultaneously, a 345 KV line tripped on a "B to C" phase fault. The fault was indicated on the line protective relays and the digital fault recorder located in the 345 KV switchyard. A line crew found a static line that had fallen down 9-10 miles outside of Quad Cities Station caused by severe weather related conditions in the area. The Operational Analysis Department (OAD), System Engineering and Electrical Maintenance were called to investigate the cause for the Unit 2 Main Generator trip. A loose electrical connection was found in a junction box on a lead off a Current Transformer under the Main Generator. The loose connection along with the indicated line fault caused the protective relay to trip which in turn tripped the Main Generator.

Immediate corrective actions included stabilizing Unit 2, placing the Unit in Hot Shutdown and initiating Work Request's to troubleshoot and repair problems found. Also, a method of verifying the integrity of the generator circuits in high vibration areas will be developed.

The safety significance to the health and safety of the onsite personnel and to the public was minimal. All expected ESF actuation's occurred as designed to bring the reactor to a safe shutdown condition.

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PDR ADDCK 05000265
S PDR

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev. 2.0						
FACILITY NAME (1)		DOCKET NUMBER (2)							LER NUMBER (6)				PAGE (3)						
									Year	Sequential Number	Revision Number								
Quad Cities Unit Two		0	5	0	0	0	2	6	5	1998	0	0	3	0	0	2	of	0	4
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																			

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power.

EVENT IDENTIFICATION: A Unit Two Main Generator Trip and Subsequent Reactor Scram occurred due to a loose electrical connection in a current transformer that was caused by vibration.

A. CONDITIONS PRIOR TO EVENT:

Unit:	2	Event	06281998	Event	0223
Reactor	1	Date:		Time:	
Mode:		Mode	Power Operation	Power	100%
		Name:		Level:	

This report was initiated by Licensee Event Report 265 / 98-3

Power Operation (1) - Mode switch in the RUN position with average reactor coolant temperature at any temperature.

B. DESCRIPTION OF EVENT:

On 06281998, at 0223, Unit 2 was in Power operation at 100% power. A Unit 2 Main Generator trip occurred. A walkdown of the relay targets associated with the Unit 2 Main Generator was performed. Protective relay 87G2-C (Generator "C" Phase Differential 87 Trip 86 Relay) [EL] was found actuated. Simultaneously with the generator trip, 345 KV Line 0403 also tripped on a "B to C" phase fault. The fault was indicated on protective relays and the digital fault recorder located in the 345 KV switchyard. A line crew was dispatched and found a static line that had fallen down 9-10 miles outside of Quad Cities Station.

The Main Generator protective relay 87G2-C actuates if there is a difference of greater than 0.2 amps in the "C" phase between the Generator current transformer (CT) [XCT], Main Transformer CT and the Auxiliary Transformer CT. The "B to C" phase line fault that occurred should not cause the relay to actuate. Troubleshooting Work Request (WR 980066361-01) was initiated to perform inspections, troubleshooting and repair of the U2 Main Generator. Work Request (NWR #970092097-01) was authorized for Operational Analysis Department (OAD) to perform Main Generator Relay surveillance.

Visual and physical inspections were performed on the CTs under the Unit 2 Main Generator. The CTs are in a normally high vibration area. A loose electrical connection was found in a junction box on a lead off the "C" phase of CT "T3X1". The screw type connection was approximately 1/2 to 3/4 turn loose. Inspection of the loose connection found no arcing or any other physical damage. The lead was cleaned, re-landed and tightened.

A loose connection on the Main Generator CT can create a high resistance connection. The "B to C" phase line fault coupled with the high resistance connection of the Main Generator CT was the only identified cause for the protective relay to exceed the 0.2 amps set point and trip the relay.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev. 2.0					
FACILITY NAME (1)	DOCKET NUMBER (2)							LER NUMBER (6)				PAGE (3)						
								Year	Sequential Number	Revision Number								
Quad Cities Unit Two	0	5	0	0	0	2	6	5	1998	0	0	3	0	0	3	of	0	4
TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]																		

C. CAUSE OF THE EVENT:

The cause to this event is attributed to not having a preventative maintenance program in place to check for loose connections in normally high vibration areas. The loose screw created a high resistance connection which during the fault condition on "B to C" phase of Line 0403, caused protective relay 87G2-C (Generator "C" Phase Differential 87 Trip 86 Relay) to actuate. Protective relay 87G2-C is a GE type "CFD" which monitors current from CTs in the Main Generator power circuit. Normally an external fault would be sensed by the 3 CTs monitoring this phase and the sum of the CTs output would be equal to zero. The high resistance connection caused the output sensed by the protective relay to exceed the 0.2 amps set point and the relay tripped. As part of the routine preventative maintenance program in place, OAD performs a sensing circuit check on the CTs to check for continuity. This check does not measure resistance of the circuit. A preventative maintenance program that includes a resistance measurement may have detected high resistance of the loose connection in CT and appropriate maintenance actions could have been taken to prevent the event from occurring.

D. SAFETY ANALYSIS:

The safety significance to the health and safety of the onsite personnel and to the public was minimal. All expected ESF actuation's occurred as designed to bring the reactor to a safe shutdown condition. The reactor scram and turbine trip occurred as designed following the generator trip initiated by its protective relaying, with turbine power output greater than 45%. This scram is intended to prevent exceeding the minimum critical power ratio (MCPR) safety limit by anticipating the rapid increase in pressure, neutron flux and heat flux which results from a fast closure of the turbine control valves. If the turbine trip at power greater than 45% scram had failed, a reactor scram would still have occurred from an Average Power Range Monitor (APRM) high neutron flux and/or turbine control valve closure.

E. CORRECTIVE ACTIONS:

Corrective Actions Completed:

1. Immediate corrective action stabilized Unit 2 and placed the Unit in Hot Shutdown.
2. Work Request 970092097-01 was performed to check the operation of the protective relays associated with generator trips.
3. Work Request 980066361-01 was performed to investigate and repair problems found with the Main Generator trip including the repair of the loose wire found on the CT.
4. Work Request 980066720-01 was performed to verify the proper operation of the protective relay at power.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev. 2.0							
FACILITY NAME (1)	DOCKET NUMBER (2)							LER NUMBER (6)				PAGE (3)								
								Year		Sequential Number					Revision Number					
Quad Cities Unit Two	0	5	0	0	0	2	6	5	1998		0	0	3		0	0	4	of	0	4
TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]																				

5. Work Request 980066412-01 was performed to install a digital fault recorder in the circuit to monitor for any disruptions during startup and operation.
6. Work Request 980066625-01 was performed on Unit 1 to check for possible loose connections associated with the generator circuitry.

Corrective Actions to be Completed:

1. A method of verifying the integrity of the generator circuits in high vibration areas will be developed by OAD to determine appropriate preventative maintenance activities, including periodicity, by 09301998. (NTS 26518098SCAQ00003.01;OAD)

F. PREVIOUS OCCURRENCES:

A search for LER's over the last two years that were attributed loose electrical connections caused by vibration did not produce any responses.

G. COMPONENT FAILURE DATA:

Not applicable

CATEGORY 1

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